



Development, Validation, Implementation and
Enhancement of a Voluntary Protection Programs
Center of Excellence (VPP CX) Capability for
Department of Defense (DoD)

Hazard Analysis of Routine Activities



DoD Lead Agent:
Office of the
Assistant
Secretary of the
Army
(Installations and
Environment)

Department of Defense
Voluntary Protection
Programs Center of
Excellence

Operated by:
CTC  *Concurrent
Technologies
Corporation*



Objectives

After this training you will be able to:

- Understand the difference between hazard analysis and risk analysis
- Compare and contrast various methods for performing hazard analyses of routine activities
- Define the benefits of a JHA
- Identify how to address hazards using JHA
- Identify hazard mitigation controls
- Describe hazard prioritization
- Identify the role of Leadership in hazard analysis.





Purpose of Hazard Analysis

- A hazard analysis is the evaluation of the hazards associated with an employee's work activity
- A hazard analysis focuses is on “fixing” the system or root causes that brought the hazardous condition or unsafe practice into the workplace
 - Provides organized approach for the evaluation of a process
 - Identifies hazards, root causes and corrective actions.
- A hazard analysis attempts to incorporate “Safe Behavior” into the normal operating procedures.



Hazard Analysis Methods

POTENTIAL FAILURE MODE AND EFFECTS ANALYSIS IN MANUFACTURING AND ASSEMBLY PROCESSES (PROCESS FMEA)

FMEA Number MM-2000

Item MB4-2X

Process Responsibility Goodson

Prepared By R. Yates/867-5309

Model Year(s)/Program(s) 2001/N/A

Key Date 4/24/2001

FMEA Date (Orig.) 2/2/1999

(Rev.) 01/02/2001

Core Team Sam and Janet Evelyn

Process Function Input/Outputs	Potential Failure Mode	Potential Effect(s) of Failure	S e v	Class	Potential Cause(s)/ Mechanism(s) of Failure	O c c	Current Process Controls - Prevention - Detection	D e t	R P N	Recommended Action(s)	Resp. & Target Compl. Date	Action Results				
												Actions Taken	S e v	O c c	D e t	
010 - Wind wire around index finger																
001 - Coil diameter	Diameter too large	-Coil hits battery during operation - Rotor is short because too much material is used in coils	8	0	Wire wound loosely	3	-Char Control 1: Measure with gage.	4	96	None						
	Diameter too small	- Weak motor - Difficult removal from finger	6		Finger too small	4		3	72	None						
	Diameter too large	-Coil hits battery during operation - Rotor is short because too much material is used in coils	8		Finger too large	5		3	120	None						
	Diameter too small	- Weak motor - Difficult removal from finger	6		Wire wound tight	8		3	144	Provide operator with a tool for grasping the wire that limits the tension.						
002 - # of coils	Too few coils	- Motor too weak	5	0	Operator miscounts	2	-Char Control 1: Operator counts number of coils out loud.	3	30	None						
					Not enough wire	3		4	60	None						
	Too many coils	- Rotor too short to reach supports - Motor too powerful - Wasted material	8		Operator miscounts	2		3	48	None						
110 - Coil starting position	Starting position too incorrect (long or short)	- Opposing wire end too short to reach support - Not enough wire to wind all coils	7		Light dim so ruler hard to read	2	-Char Control 1: Use ruler to locate start position.	3	42	None						
					Ruler worn so hard to read.	3		3	63	None						

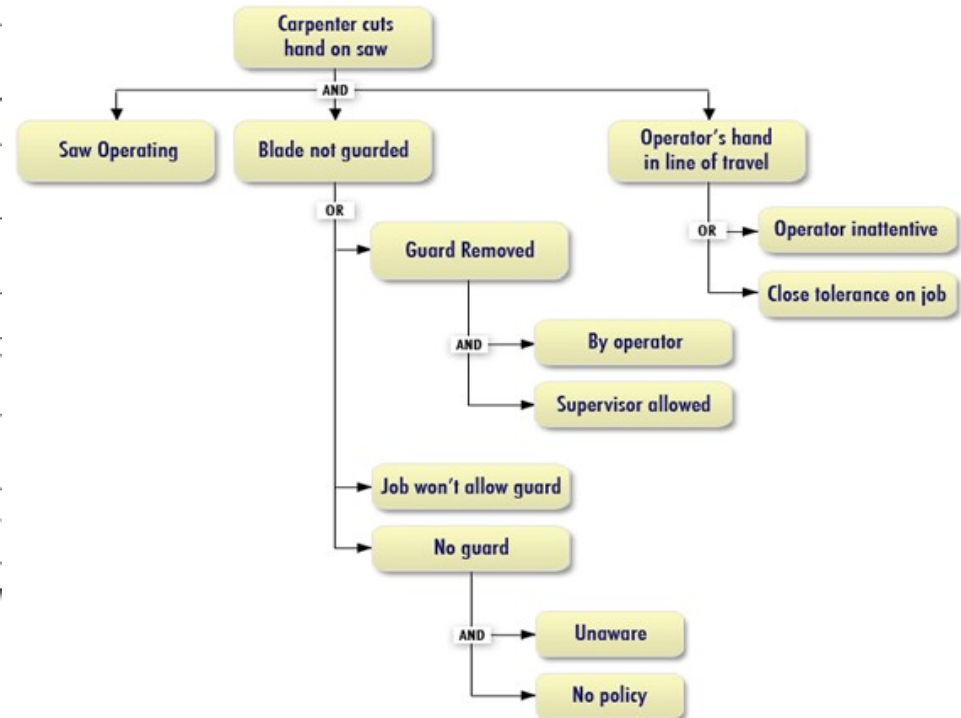
Saw Operating

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FMEA



Fault Tree
Analysis





Hazard Analysis Methods

Job Hazard Analysis

Job/Task: _____ Location: _____

Job/Task Step	Hazard Type	Hazard Source	Body Parts At Risk	Severity	Probability	Risk Code	Control Method ¹

(¹) Note: Engineering, work practice, and/or administrative hazard controls such as guarding must be used, if feasible, before requiring employees to use personal protective equipment.

Certification of Assessment

*Name of work place: _____ *Address: _____
*Assessment Conducted By: _____ Title: _____ *Date(s) of Assessment: _____
Implementation of Controls Approved By: _____ Title: _____ Date: _____

Job Hazard Analysis Matrix						
Severity of Injury		Probability of an Accident Occurring				
Level	Description	A Frequent	B Several Times	C Occasional	D Possible	E Extremely Improbable
I	Fatal or Permanent Disability	1	1	1	2	3
II	Severe Illness or Injury	1	1	2	2	3
III	Minor Injury or Illness	2	2	2-3	3	3
IV	No injury or illness	3	3	3	3	3

Risk Priority		
Code	Risk Level	Action Required
1	High	Work activities must be suspended immediately until hazard can be eliminated or controlled or reduced to a lower level.
2	Medium	Job hazards are unacceptable and must be controlled by engineering, administrative, or personal protective equipment methods as soon as possible.
3	Low	No real or significant hazard exists. Controls are not required but may increase the comfort level of employees.

← JHA

JSA →

JOB SAFETY ANALYSIS	JOB TITLE: Compactor Operator	JSA No. _____	DATE: 8/23/99	NEW ☐ REVISED ☐
Page 1 of 1	TITLE OF PERSON WHO DOES JOB: Grounds Crew	SUPERVISOR:	ANALYSIS PERFORMED BY: Troy Tepp, Sentry Insurance	
ORGANIZATION: State Fair Park	LOCATION: Refuse Collection	DEPARTMENT: Grounds	REVIEWED BY:	
SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED ACTION OR PROCEDURE		
1. Pull/push full dumpster into hydraulic lift gate.	- Lower back, arm, and shoulder strain. - Pinched hand between gate and rolling dumpster. - Hitting head on horizontal gate member.	- Repair/improve condition of lot pavement. - Install larger wheels or properly inflate existing wheels. - Push dumpster to move, pull to steer/guide. - Wear protective canvas or leather gloves. - Install plugs to drain water from dumpster. - Use a tugger or other motorized cart to move dumpsters.		
2. Raise hydraulic lift gate to "UP" position, dumping contents.	None observed.	None observed.		
3. Spray remaining trash residue from raised dumpster with water.	Trash particles and water spray into eyes.	ANSI approved eye or face protection when spraying/cleaning the dumpster.		
4. Lower hydraulic lift gate and emptied dumpster back to ground level.	Crushing injury if a person is under the lowering gate.	- Install an automatic lowering alarm. - Install an emergency-stop button on gate frame. - Install a physical barrier across entrance of gate frame to prevent entry.		
5. Pull empty dumpster from the gate to the designated area for placement on the grounds.	Lower back, arm, and shoulder strain.	- Repair/improve condition of lot pavement. - Install larger wheels or properly inflate existing wheels. - Push dumpsters to move, pull to steer/guide. - Wear protective canvas or leather gloves. - Use a tugger or other motorized cart to move dumpsters.		



Hazard Analysis Benefits

- The hazard analysis:
 - Increases employee hazard recognition and awareness
 - Standardizes operations based on acceptable safe practices
 - Identifies appropriate Personal Protective Equipment (PPE)
 - Facilitates formal documentation of employee's knowledge of the job requirements.





Hazard Analysis for Management

- Management must:
 - Identify hazards in the workplace that could result in injury or illness
 - Evaluate the level of risk to help determine what controls to implement
 - Select an appropriate solution to control the hazard and/or protect the employee.





Hazard Analysis for Employees

- Employees must understand hazard analysis/analyses is a VPP recognition requirement
- Employees need to be involved in hazard analysis/analyses from the beginning so:
 - The process that is taking place is better understood
 - The value of a change is seen by the employee.





Hazard Analysis vs. Self-Inspection

Hazard Analysis vs. Routine Self-Inspections		
What?	Hazard Analysis	Routine Self-Inspections
	- Identifies process or task-specific hazards and required controls	- Area or equipment inspection
When?	- Initially to determine baseline hazards and controls; when changes invalidate previous analysis	- At least monthly, covering the entire site quarterly
Who?	- Supervisors, employees, and/or S&H staff	- Managers, Supervisors, employees, and/or S&H staff
Why?	- Control or eliminate hazards - Establish baseline from which to measure effectiveness of corrective actions - Improve hazard control programs - Train employees on safe work practices, hazard recognition, and hazard elimination/control techniques	- Correct hazardous conditions - Determine undesirable trends - Modify S&H goals and objectives - Train employees on hazard recognition

Addressing Hazards Using JHAs



Job Hazard Analysis





Types of Work Place Hazards



- | | |
|--|-----------------------|
| - Impact hazards | - Optical Radiation |
| - Penetration hazards | - Biological hazards |
| - Compression hazards | - Noise hazards |
| - Chemical hazards | - Electrical hazards |
| - Heat/Cold | - Ergonomic |
| - Harmful dust | - Work Place Violence |
| - Smoke and noxious or poisonous gases | - Other |





Root Causes

- Potential causes of injuries include:
 - Lack of knowledge
 - Lack of physical ability
 - Prior training that included unsafe practices
 - Organizational and cultural perception of what is acceptable behavior
 - Previously unidentified hazard
 - Newly introduced hazard resulting from process or equipment change.



2

DETERMINE
ROOT CAUSE



Addressing Hazards

- Elimination of a specific hazardous work process, or preventing it from entering the workplace, is the most effective method of control
- Hazards should be eliminated at the development stage
- Substitution should be used when a particularly dangerous chemical or work process cannot be completely eliminated.





Hazard Mitigation

- Hierarchy of controls to mitigate risk



- Use combination of one or more mitigation techniques.





Engineering Controls

- Engineering controls eliminate exposure to the hazard by:
 - Isolating the employee from the hazard
 - Improving (redesign) work area layout
 - Substituting less hazardous product
 - Modifying equipment.





Administrative Controls

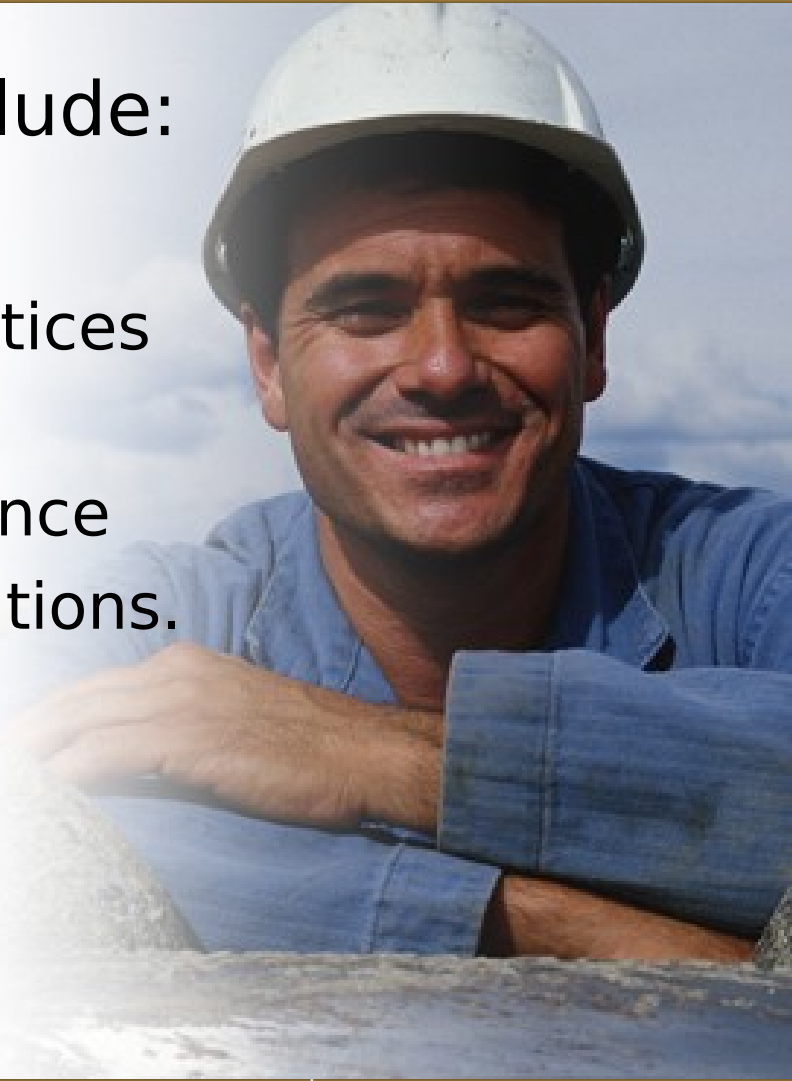
- Administrative controls reduce employee exposure to a hazard by:
 - Reducing the frequency of performing the hazardous task
 - Rotating employees to reduce exposure time
 - Training employees to recognize hazards and employ safety practices.





Work Practices

- Work practice controls include:
 - Workplace rules
 - Safe and healthful work practices
 - Personal hygiene
 - Housekeeping and maintenance
 - Procedures for specific operations.





PPE

- OSHA requires employers to utilize PPE to reduce employee exposure to hazards when engineering and administrative controls are not feasible or effective
- PPE alone should not be relied on to protect against hazards; other uses include guards, engineering controls, and sound manufacturing practices.





Evaluate Effectiveness

- Assess how well the JHA process is “fixing” hazardous conditions by:
 - Updating JHAs for routine and non-routine task
 - Ensuring JHAs were developed for all new processes
 - Conducting routine self-inspections
 - Examining Industrial Hygiene reports
 - Reviewing investigation findings for injuries and near misses
 - Following up on employee concerns.
- Incorporate evaluation into Annual Program Evaluation process.



Hazard Prioritization



Hazard Prioritization

- Severity is the classification of deficiencies that indicate the level of harm caused by the hazard
- Probability is the extent to which something is likely to happen.

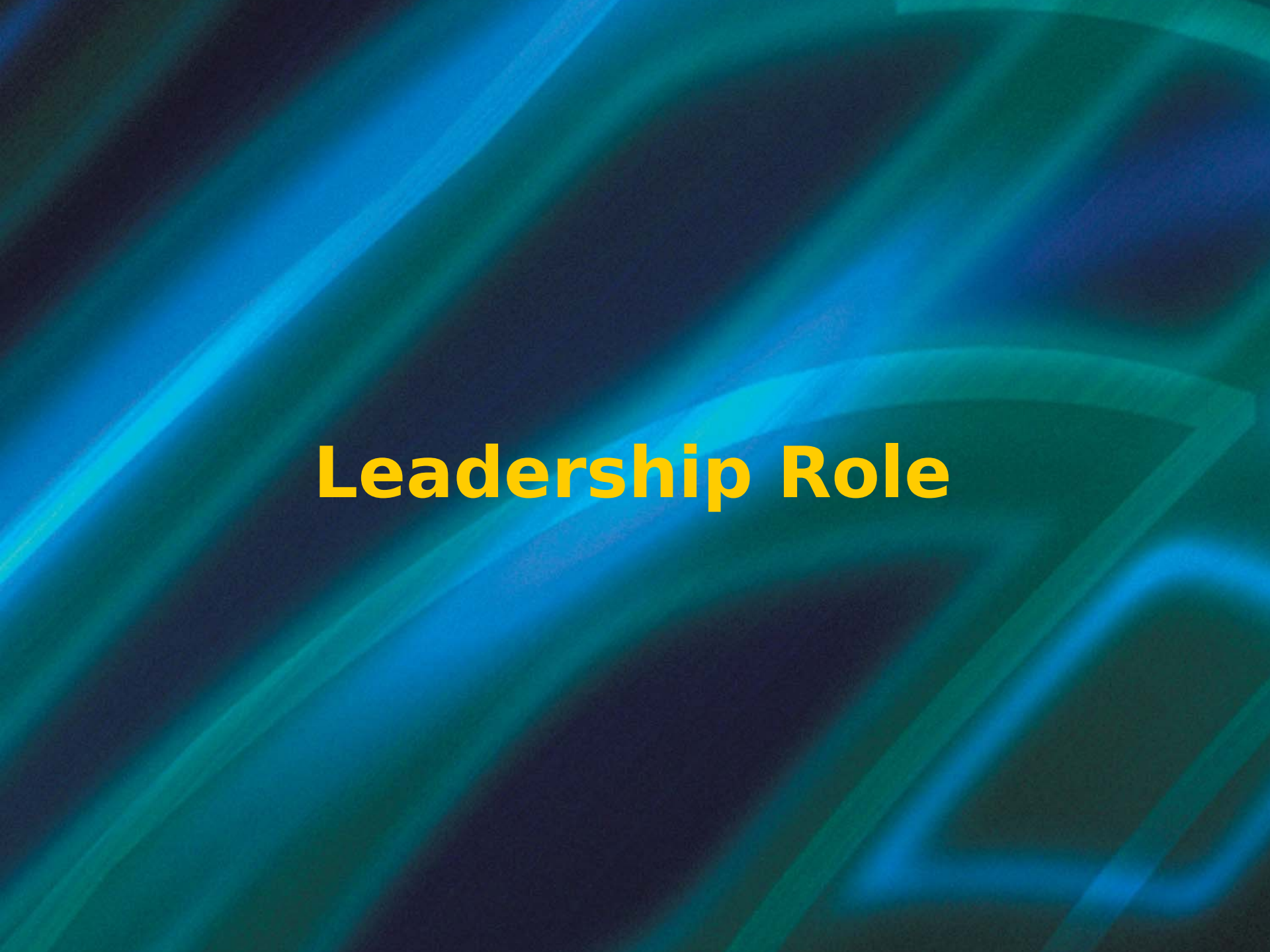
Severity	Mishap Probability			
	A	B	C	D
I	1	1	2	3
II	1	2	3	4
III	2	3	4	5
IV	3	4	5	5



Residual Risk

- After controls are put into place, remaining risk requires appropriate level approval authority to accept risk to continue operation/process
- Approval authority is defined by organizational structure or by regulation
- Increasing level of approval hierarchy is required for progressively higher levels of risk.



The background is an abstract composition of flowing, wavy lines in various shades of blue and teal, creating a sense of movement and depth. Overlaid on these are several translucent, geometric shapes, including a large triangle and a square, which add a structural element to the fluid background.

Leadership Role



Leadership Role

- Prioritize hazard analysis process based on risk
- Actively support employee participation in identification of work related hazards
- Monitor programs to address identified risks
- Create “fix the system” safety culture.





Summary

In this section you learned about:

- The difference between hazard analysis and risk analysis
- Various methods for performing hazard analyses of routine activities
- The benefits of a JHA
- How to address hazards using JHA
- Hazard mitigation controls
- Hazard prioritization
- The role of Leadership in hazard analysis.



Questions?